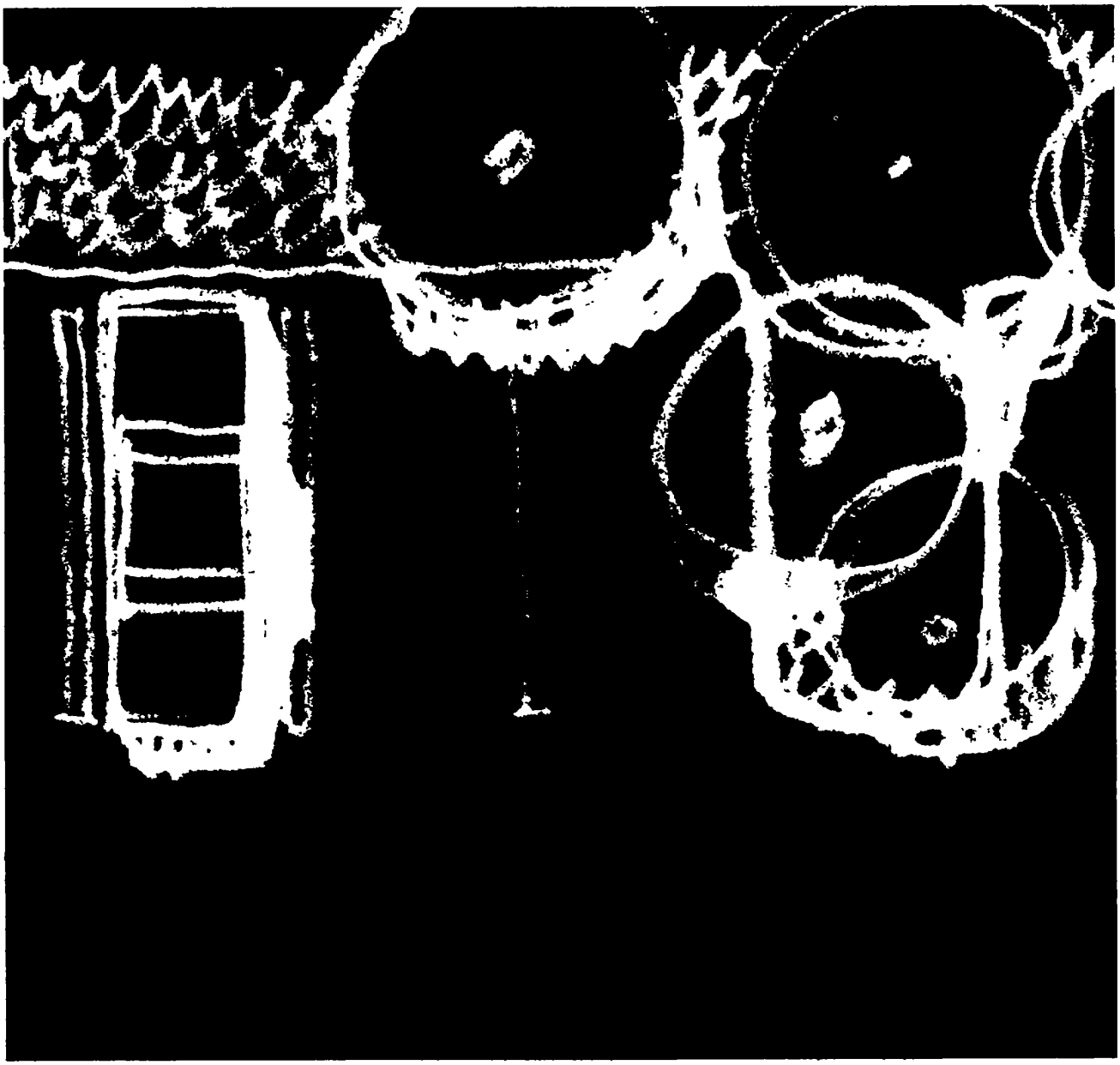
Parking is one of the most space-consuming land uses on military installations and typically dominates the landscape setting of facilities. It usually is one of the most visually disruptive elements within an installation. Opportunities for creating pleasant people-oriented spaces around and between buildings or providing good views to and from buildings are too often given over to expansive surface parking lots with minimum design treatments to mitigate their negative impact on the visual quality of an installation.

By locating facilities conveniently to each other and encouraging alternative modes of access, much can be accomplished to reduce dependence upon the automobile and its parking requirements. While the provision of convenient parking facilities is essential, appropriate site planning and design treatments can be used to minimize their negative visual impact.



Section I:

Observations and Objectives.

5-1.
Typical Problems.
The design of parking facilities has too often been handled insensitively. They have been frequently located in poor relationship to streets, the facilities they serve, adjacent land uses and natural site features *(fig. 5-1).*

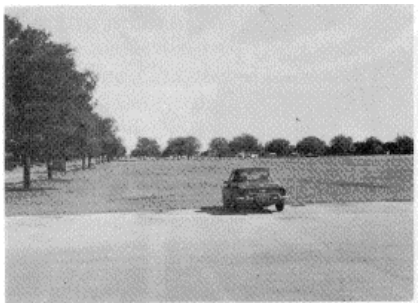


Fig. 5-1.

A. Off-street Parking.
Parking lots have often been designed without provision for plant materials, thereby creating the appearance of an unrelieved ocean of cars *(fig. 5-2).* Sometimes they have been built with unrestricted access from the street, mixing higher-speed street traffic with internal parking circulation, which is both unattractive and dangerous.

B. On-street Parking.
On-street parking, common in most military installations, results in large expanses of pavement, and often provides no opportunity for a more pleasant and attractive transition between the street and adjacent buildings *(fig. 5-3).* In addition, on-street parking reduces the traffic-carrying capacity of the roadway.

Fig. 5-2.

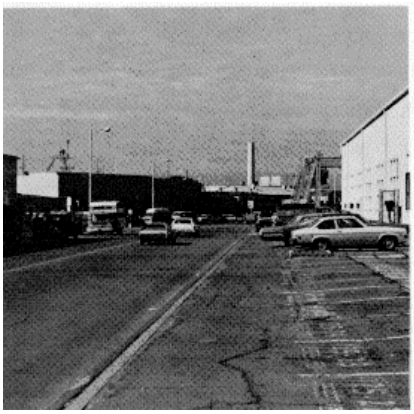


Fig. 5-3.

5-2.
Objectives.
A. Reduce the Visual Impact of Parking Facilities.
The provision of sufficient, conveniently located parking is a functional prerequisite in the site design of military installations. However, simply reacting to this need is not enough. Every feasible measure should be taken to minimize the obtrusive effect of parking on the visual environment.

B. Minimize Parking Requirements and Land Coverage.
Parking requirements can be reduced by encouraging carpooling and alternative modes of travel. Areas within parking lots may be designed with smaller stalls to accommodate only small cars and-motorcycles thus reducing the total required land coverage. Furthermore, the economic and environmental factors that influence the use of parking structures should be taken into account.

Section II:

Design Guidelines.

5-3.
Types of Parking Facilities.
Provide parking in accordance with the following overall guidelines for various parking facility types.

A. On-street Parking.
On-street parking facilities include parallel parking on one or both sides of the street, and angled or perpendicular parking bays. In general, on-street parking should be avoided *(fig. 5-4).* Parallel on-street parking should only be allowed on cul-de-sacs and tertiary streets where infrequent visitor or overflow parking needs occur. Employee parking should not be allowed on residential streets.

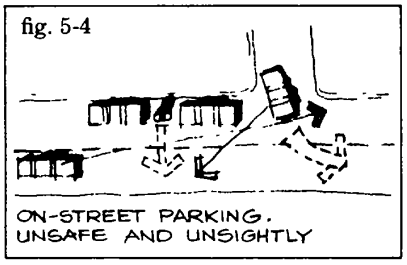


Fig. 5-4.

B. Off-street Surface Parking.
Adequate off-street parking eliminates the need for on-street parking. It should be the predominant method of automobile

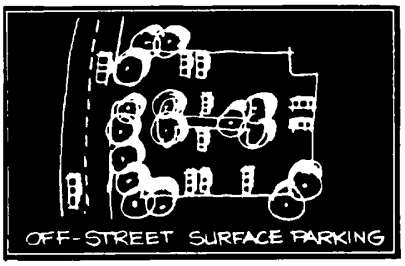


Fig. 5-5.

parking on installations. All installation facilities should provide sufficient off-street parking to meet their particular needs *(fig. 5-5).*

C. Parking Structures.
Parking structures, both below or above grade, have limited application at certain installations, particularly in densely developed areas where available land is scarce. Parking structures are expensive but can provide a number of benefits including efficient land use, reduced visual impact and protection of vehicles from inclement weather *(fig. 5-6).*

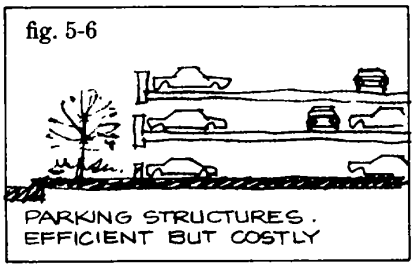


Fig. 5-6.

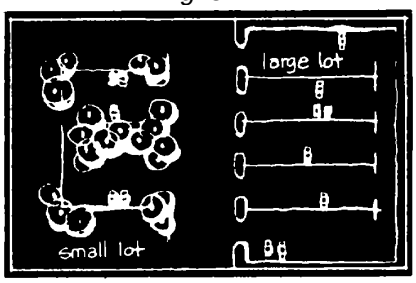
5-4. Off-street Surface Parking.
A. Area Requirements.
The total quantity of parking in any one location will vary with the needs of the facility. Criteria for determining the number of parking spaces for non-organizational vehicles authorized for various types of facilities are listed in Table 4-1 of DOD 4270. 1-M.

1. Allocate 400 square feet per car (includes access drives and planting islands) for initial planning purposes. (DOD authorizes 35 square yards or 315 square feet per car for parking lot space with normal entrance and exit.)

2. Minimize parking requirements of a facility by selecting a site that will allow the sharing of parking with other related activities and will promote other means of access, such as walkways and bikeways, between activities to reduce dependence on the automobile.

3. Small parking lots are usually preferable to large lots, as they enhance the visual environment by increasing the percentage of landscaped area to paved area and allow more conformance to natural topography *(fig. 5-7).* The unrelieved monotony of large parking areas may be altered by developing alternative designs, such as curvilinear plans *(fig. 5-8).* However careful design of curvilinear parking lots is necessary to avoid exceeding the authorized space per car.

Fig. 5-7.



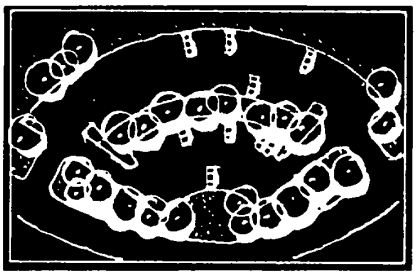


Fig. 5-8.

B. Locational Guidelines.
Locate parking facilities for convenience and safety.

1. Locate off-street parking convenient to building entrances.

2. Dead-end parking lots should generally be avoided.

3. Provide the opportunity for vehicular/pedestrian separation, especially in large parking lots.

4. Develop parking on relatively level areas to avoid excessive cut and fill situations that create erosion and landscape reconstruction problems *(fig. 5-9).*

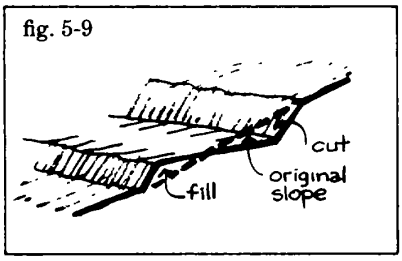


Fig. 5-9.

5. Use natural topography and existing trees to visually screen parking areas from adjacent facilities or other parking bays.

6. Headlight glare from parking vehicles may be avoided in residential areas if parking is located at a lower elevation than the structure. Parking located on the downgrade can be easily screened and will not obstruct site lines from the structure *(fig. 5-10*). If site conditions necessitate the location of parking at the same level or at a higher elevation than the structure, various screening techniques may be employed to shield headlight glare and reduce the negative visual impact of the parking lot.

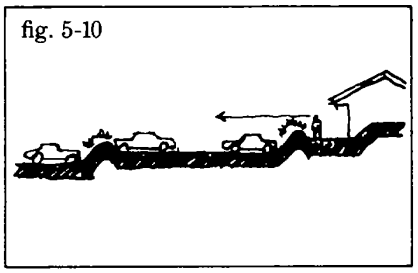


Fig. 5-10.

C. Parking Lot Layout.
In order to economize on space and provide easy circulation, parking areas should usually be laid out with 90-degree stalls and with aisles wide enough for two-way traffic. Where a slow rate of turnover is expected, 90 degree parking is particularly desirable.

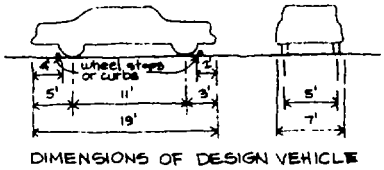


Fig. 5-11.

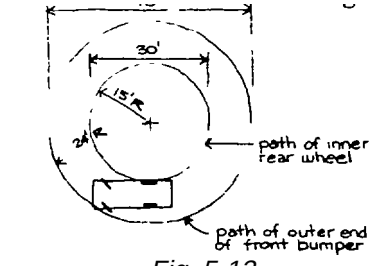


Fig. 5-12.

Where a fast rate of turnover is expected or where required by site limitations, 60 or 45-degree parking with one-way aisles may be used. However, the advantage of easy execution of 60- and 45-degree parking is frequently offset by the inconvenience of one-way aisles and roundabout circulation.

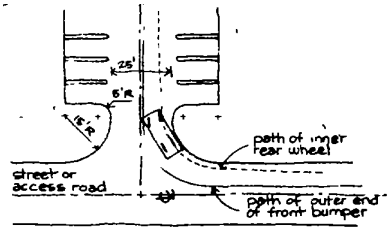


Fig. 5-13.

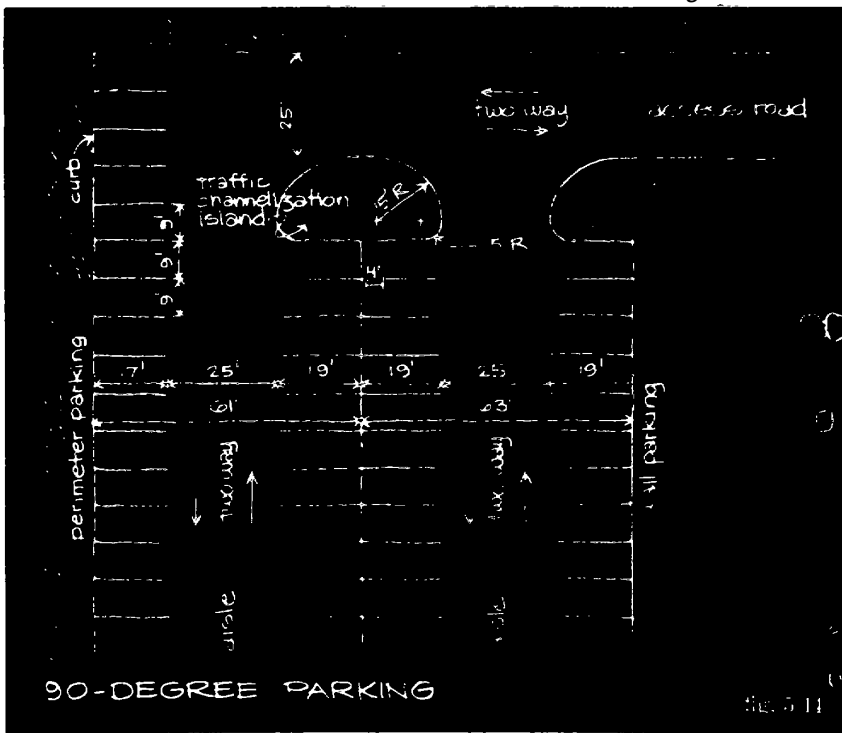


Fig. 5-14.

1. A separate parking area for employees of a facility should be considered to avoid a mixture of all-day parking with customer parking that has a fast turnover rate An employee parking area should be physically separated from the main parking area by a barrier or should be located adjacent to and with access off of a service road to the facility.

2. Information on the design vehicle and dimensions for typical parking areas, with stalls arranged at 90 degrees, 60 degrees, 45 degrees and parallel to the aisle, are illustrated in figures 5-11 through 5-20. Note where the dimensions for perimeter parking stalls vary from those in the interior and from those against a wall.

3. When 90-degree on-street parking must be used, increase the stall length by 4 feet. When 60- or0 45-degree on-street parking must be used, increase the stall length by 2 feet. For parallel on-street parking, increase the width by 2 feet.

4. When very large numbers of cars must be accommodated, a provision for small car parking is encouraged. Separate bays or portions of lots can be more compactly designed and thereby reduce the required amount of paving per car. Small car parking bays should be provided with 90-degree stalls, 7'-6" stall widths, and 17'-0" stall lengths with no overhang and 15'-0" stall length on the perimeter where an overhang is permitted. Driving aisles should be two-way and 18 feet wide.

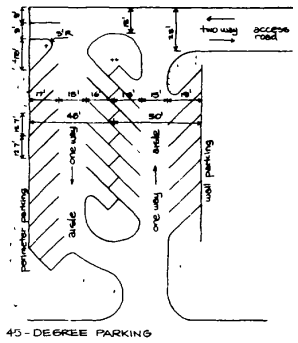


Fig. 5-15.

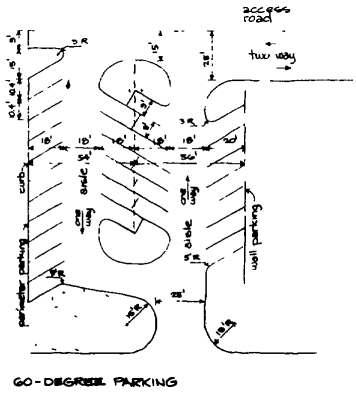


Fig. 5-16.

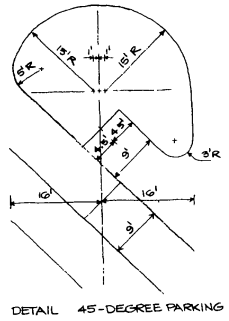


Fig. 5-17.

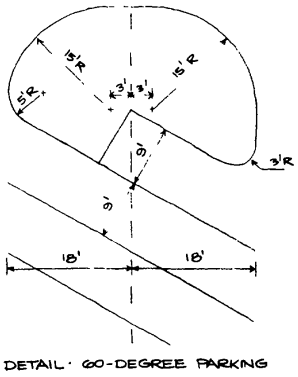


Fig. 5-18.

Fig. 5-19.

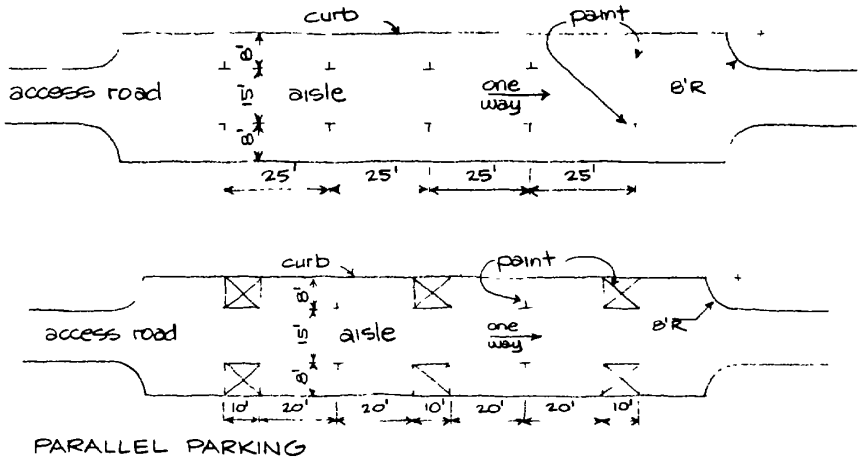


Fig. 5-20.

5. To minimize conflicts with street traffic, parking area entrances and exits should be kept to the minimum necessary for peak-hour requirements and located at least 50 feet from street intersections. Provide a minimum of 20 feet for the buffer strip separating a parking area from a street *(fig. 5-21).*

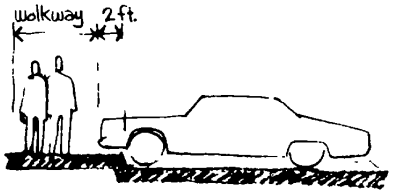


Fig. 5-23.

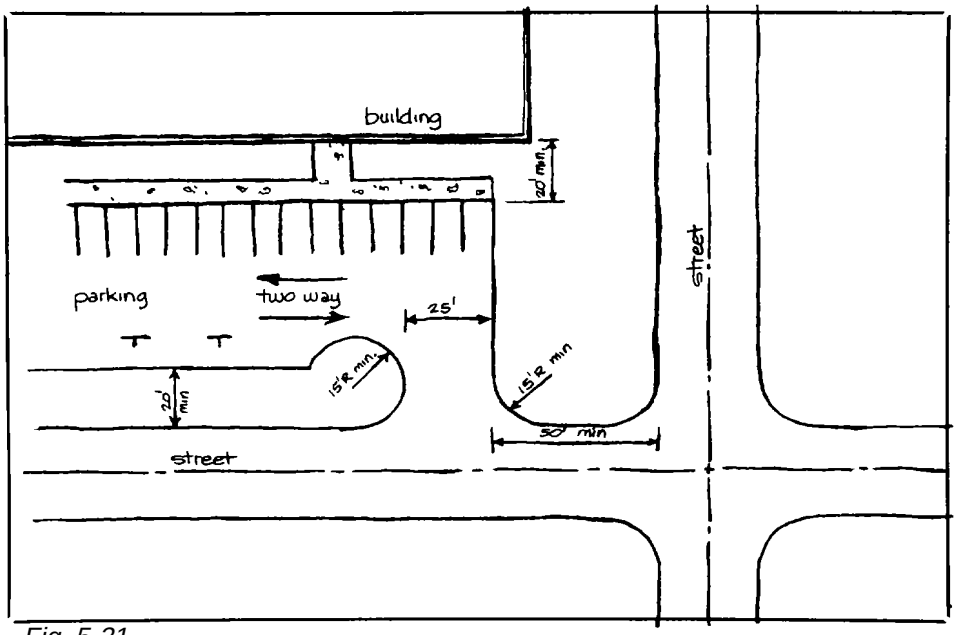


Fig. 5-21.

6. Avoid parking directly adjacent to buildings. Allow adequate space for planting and/or walks (20 feet minimum) between parking areas and adjacent buildings *(fig. 5-22).*

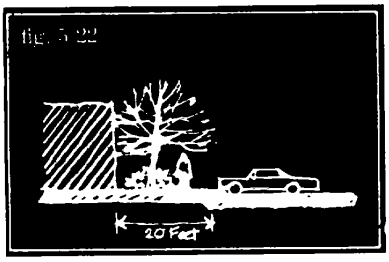


Fig. 5-22.

7. Walkways at the head of parking stalls should be two (2) feet wider than required by pedestrians to accommodate bumpers overhang *(fig. 5-23).*

Fig. 5-24.

8. When islands are used to separate parallel parking bays, the minimum width should be 12'-0" to provide a margin between overhanging bumpers and plants (*fig. 5-24).* Widths should vary upwards to accommodate existing topography and trees.

9. Intermediate islands, a minimum of 9'-0" wide, should be used to help define vehicular circulation areas in large parking areas. To be effective there should be no more. than 18 parking spaces between islands *(fig. 5-25).* Islands can be staggered and irregular in width to preserve existing trees, creating a natural or informal character, or they may be aligned regularly and of the same width, creating a formal character *(fig. 5-26).*

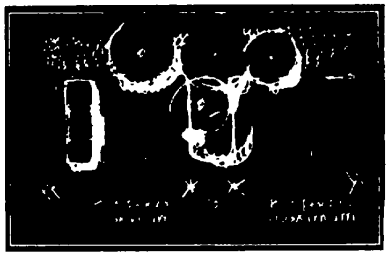


Fig. 5-25.

D. Other Type Vehicles.

Consider parking requirements of other type vehicles that may use the parking lot.

1. Design special parking spaces for recreational vehicles, boats and trailers as needed and with knowledge of their dimensions and turning radii.

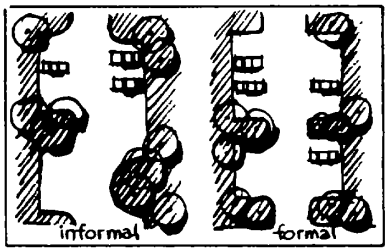


Fig. 5-26.

2. Provide properly signed parking areas for motorcycles and motorbikes within parking lots as needed. Parking lot corners can be used for motorcycle and bike parking (*fig. 5-27).*

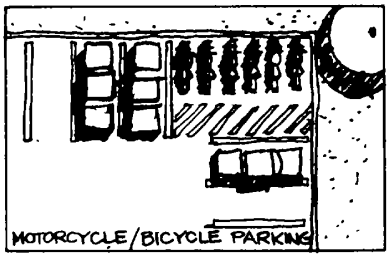


Fig. 5-27.

E. Parking Lot Details.

1. Paving. Provide hard-surfaced paving for high-use parking areas. Generally avoid gravel or- cinder paving, except for temporary construction uses.

2. Striping. All parking spaces and pedestrian crosswalks should be properly striped to define the space or crossing area. Striping color should contrast with pavement color. Double painted stripes between stalls are more effective for encouraging orderly parking than are single painted stripes *(figures 5-28 through 5-30).*

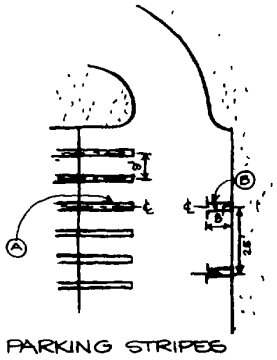


Fig. 5-28.

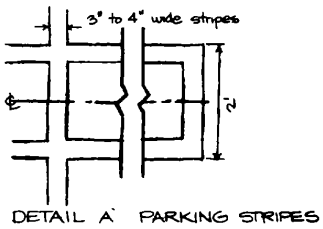


Fig. 5-29.

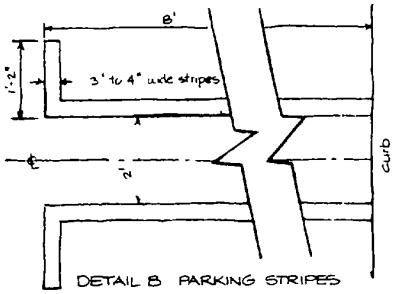


Fig. 5-30.

3. Drainage. Design drainage as a function of parking lot size, slope and drainage network location. Drainage to the naturally lower edge of a lot rather than the center of a lot is preferable.

4. Curbing. Use continuous curbing where possible to contain and channel drainage and to serve as wheel stops. Curbing is easier to maintain and visually preferable to wheel stops, but is more costly and must be designed with ramps for the handicapped.

5. Light Poles. Parking lot light fixtures should be located out of the way of traffic aisles and parking stalls. Ideally, lighting poles should be located in center or side islands, protected by raised curbs *(fig. 5-31).* Poles and fixtures should be in scale with the setting while providing the desired level of nighttime illumination.

6. Screen Planting. Perimeter screen planting of conifers can effectively control the adverse visual impact of parking lots *(fig. 5-32).(See Chapter 6: Planting.)* in addition, screen planting is an effective measure to prevent snow drifting into parking lots that are below surrounding grades *(fig. 5-33)* Screens must be set back from

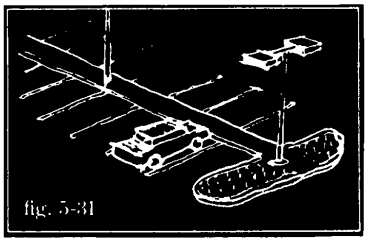


Fig. 5-31.

the pavement areas so that drifts will accumulate on the bordering area rather than on the pavement.

7. Earth Berms. Earth berms can effectively screen parking lots from view along major roadways *(fig. 5-34).* Planted earth berms along the perimeter of the lot facing the street should be designed relative to the 52" viewing height, or eye level, of a motorist. Earth berm design should be appropriate to the

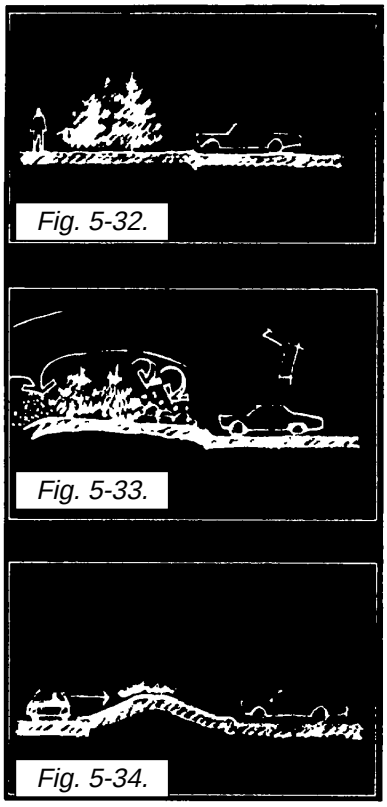


Fig. 5-32.

Fig. 5-33.

Fig. 5-34.

landscape character of the setting, i.e., it can vary from a natural, informal shape and landscape character to a more formal character with even height and regimented planting .

8. Overhead Canopy. Use trees in islands to relieve visual monotony and to provide shade in large parking lots.

5-5 Parking Structures.

A. Feasibility.

Because multi-level parking is a more intense use of land, it permits land conservation for other potential uses such as building expansion and avoids the adverse visual impacts of its alternative-surface parking lots. However, since construction costs of parking structures are typically five to six times greater than surface parking, a dense land use configuration and a relative scarcity of land are normally required to justify their provision.

B. General Guidelines.

1. Location. The siting of multi-level parking structures must be done in relation to an overall master plan Parking structures should be located close to activities generating parking requirements. In this regard, several well located smaller structures are preferable to one large structure.

2. Site Adaptation.

a. The design of multi-level parking structures should generally conform to the design guidelines of *Chapter 3: Buildings.*

b. Topography. Use existing topography to advantage in the design of parking structures.

Multi-level parking structures can be accommodated on steeper topography more easily than large surface parking lots because large grade differences may l)e negotiated in a relatively short horizontal distance This can also facilitate dual level access *(fig. 5-35).*

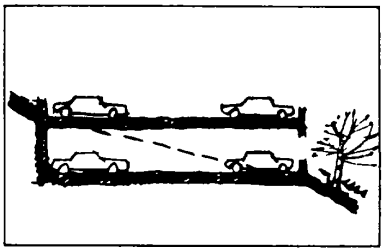


Fig. 5-35.

c. Efficiency. An above-grade continuous ramp par-king structure is generally the most efficient and economical configuration. However, the ramped (non-horizontal) nature of the structure should be carefully designed relative to its appearance and relationship to adjacent buildings *(fig. 5-36).*

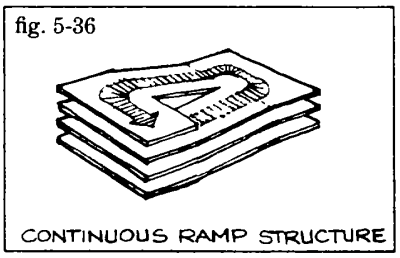


Fig. 5-36.

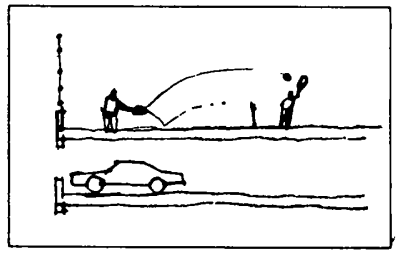


Fig. 5-38.

3. Roof Treatment. Parking structure roofs should be attractive from common vantage points such as adjacent buildings or roads Consider the potential for creating attractive and functional uses of parking structure roofs, such as plazas atop under ground structures *(fig. 5-37),* and recreational uses such as roof gardens, playgrounds, or0 tennis courts on pal king structure roofs *(fig 5-38).*

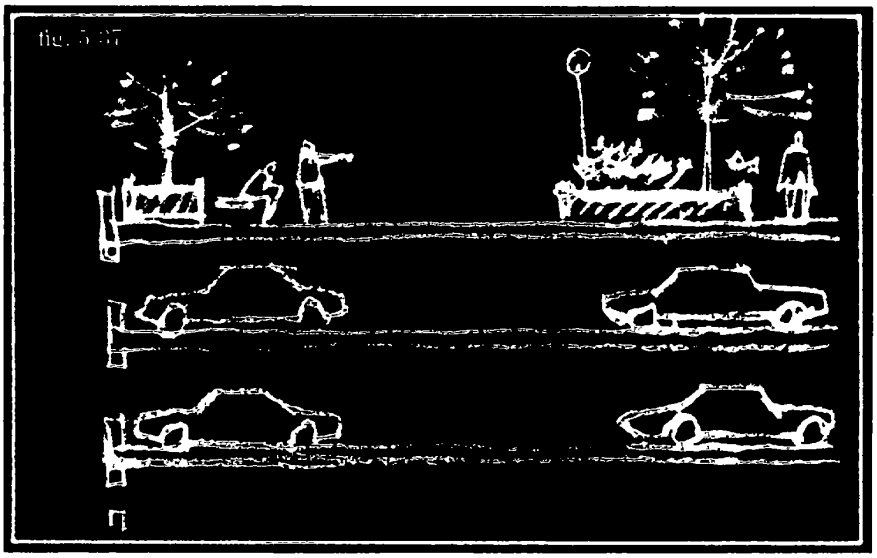


Fig. 5-37.